

Alternative cost-cutting plan at NELP

by David Jobbins

An alternative cost-cutting plan for North East London Polytechnic which would involve the closure of courses offered has been put forward.

The proposals have been drawn up by the polytechnic's academic board in response to the development plan formulated by a government working party which calls for the closure of two faculties and a number of leading departments including applied economics, sociology, maths and humanities.

The development plan, approved by the governors' policy and resources committee by only seven votes to six, is to be voted on by the governors today.

Next week the joint education committee representing Berking, Newham and Waltham Forest boroughs, is to meet to make its final decision on the polytechnic's budget. The committee is likely to require a cut in the order of £2.6 million.

Opposition to the development plan has come from two main points. Campus unions are deeply concerned at the implications for jobs. They have also joined in the general chorus of opposition from educationists to proposals to close sociology, economics, maths and many humanities courses.

The closure of the department is top of the agenda at today's meeting of the London Mathematical Society.

MPs visiting NELP as part of the investigation of the Commons select committee investigation into financing of higher education courses did not have the opportunity to meet union representatives.

The academic board plan suggests a wide range of ways of cutting spending by £2.3m which with savings already made "approximates" the demands being made by the local authorities.

The principal points are:

- Reduction of the number of facilities from eight to five.
- Adoption of pooling committee rooms for staff allocations.
- Maximization of student numbers.
- No course closure while resources are available to run them.
- Cut-backs to senior staff establishments which currently have 10 assistant directors.
- Rationalization of administration and control services.
- The academic board working party warned against precipitate action such as redundancy notices and course closures.

PNL told you may lose hall

The Polytechnic of North London has been warned that it risks losing one of its two halls of residence if it does not comply with the conditions of an anonymous offer for its construction.

The donor, thought by many to be the Queen Mother, insisted that the hall should provide meals for all residents and charge for them with the rent. But, although the hall has space for 1,000 students, it has been run on a self-financing basis throughout the year it has been open.

Lord Murray, the donor's representative, visited the James Lelands Hall last month and subsequently wrote to the polytechnic pointing out the conditions of the gift, which were intended to ensure that students mixed with others of different interests and backgrounds.

Now the polytechnic has set up a working party to consider the possibility of complying with Lord Murray's request that catering will be provided by the beginning of the 1980-81 session. A spokesman said the requirements would be met and Lord Murray would visit the polytechnic again in three months time to monitor progress.

UGC and unions may clash over funding of nurseries

by Nigel Creak

Vice-chancellors have raised with the University Grants Committee the first time in the new arrangements for student union financing; whether they will need to prevent students from spending money on nurseries.

From the academic year beginning 1981-2 student unions will be financed from UGC recurrent grants rather than indirectly by local authorities. Unions will be regarded as merely another facility provided for students in institutions of higher education.

Mr Mark Carlisle, Secretary of State for Education and Science, said specifically when he announced the new arrangements that it was expected that institutions would "continue to afford their unions freedom in the management of their affairs."

But before this was announced the UGC told universities that they must stop using their recurrent income to subsidise nurseries or creches. This policy, which was conceived in the context of existing arrangements for student union funding, has led to confusion and its interpretation.

Vice-chancellors under pressure from students who are concerned

that nurseries may be forced to close, have asked the UGC for clarification on the extent to which they may have to impose conditions on how unions should spend their money.

There are two schools of thought. One is that of student union money will emanate from the UGC. The other is that it is up to the unions, as in the past, to decide what their own financial priorities are and that the UGC did not intend to lay down guidelines for the unions.

If the second alternative were valid, it would mean that universities could agree that student unions should take over the funding of nurseries, and the unions would be free to do so. The question brings into focus the potential problem of internal conflict between universities and unions which both sides foresaw before the changes came into force.

The question could well come down to how much money will be included in the recurrent grant for student union purposes and how strictly the universities decide to allocate it. The greater the amount of money available, the easier spending priorities will be.

Student union protests against the

UGC directive continue. The Universities of London students union this week launched an appeal for funds to be able to continue its 25-place nursery. The nursery is anticipating a deficit of £7,000 by the end of this year.

The universities may find some relief in the views of the National Union of Students. Ms Flouie McGee, vice-president said: "When the announcement of the new system was made it was specified this would not mean any new controls. If so, that implies that UGC regulations governing nurseries would not be applicable to the students' union."

"But we have always held the view that students' unions should not try to run nurseries. This is because of financial unpredictability but also because within the institution, when discussion about the union's role is going on, the union is planning to spend money which the UGC would not allow, it would be difficult for the union to win the argument."

There would also be the problem that if the union took on a nursery and the financial situation became worse, it would find itself in the position of having to cut its own students off, she said.

Tory students to debate NUS membership

by Paul Flather

The Federation of Conservative Students, with 19,000 members, is bracing itself for a furious debate on its policy to stay "inside" the National Union of Students.

The debate has been fuelled by an article which appears today in *News* magazine, written by Mr Peter Young, one of the two main candidates for the presidency of the NUS, and elected at next week's national conference at Loughborough.

Mr Young, arrested earlier this year at an unofficial youth camp in Ireland, says in the article that the NUS is "the only body which is not a party to the game" and that it is "the only body which is not a party to the game" and that it is "the only body which is not a party to the game".

Our main task is to ensure that the NUS is not a party to the game, she said.

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Engineer to be OU's new vice-chancellor

by Charlotte Barry

The next vice-chancellor of the Open University will be Professor John Horlock, vice-chancellor of Salford University, it was announced today.

Professor Horlock, who is a distinguished engineer, will take up the post on January 1 next year, following the retirement of Lord Perry of Walton.

During the pioneering spirit of the OU's first 10 years, Professor Horlock seems undaunted by the prospect of financial stringencies which threaten its further growth.

He admits a limited experience of adult education and teaching of a distance but says: "I have always admired what the Open University has done."

Professor Horlock's other main field of interest is postgraduate education. He is keen to continue his research on thermodynamic aerodynamics and the thermodynamics of power plants, on which he has published several books and numerous technical papers. He is also a director of British Eagle Insurance Ltd and chairman of the Aeronautical Research Council.

Three-point plan to solve poly funding wrangle

by Peter David

A three-point plan for funding polytechnic and colleges in 1981-82, designed to avoid a repetition of the erratic cuts in this year's budgets, has been confidentially drawn up at the Department of Education and Science.

The three main elements of the plan are:

- A "safety net" in the spread of the effect of cuts in the advanced further education (AFE) pool, so that no local authority is faced with an unfair rate burden.
- Rolling funding, so that authorities which suffer excessive cuts one year can be compensated the next.
- The use of average units costs to ensure that local authorities' higher education spending plans are fair and realistic.

The proposals were outlined at a joint committee meeting this week consisting of central and local government officials, teacher union representatives and polytechnic and college heads. They are described as the next best thing to a rational system based on educational judgments, which the committee believes cannot be devised in time for next year.

A document drawn up by the committee explains how the new system would work and contains the first official "post-mortem" on the Government's decision to limit in advance the size of the AFE pool, which is a share of the £400m spent annually in public sector higher education.

It says that the £41m shortfall in the pool this year, and the method used to distribute the cut to individual educational authorities, resulted in a variety of "inequitable" situations.

These included some authorities receiving more money than they needed, while others suffered an "unacceptably large" loss equivalent to a 2p rate. Many authorities made substantial cuts in college budgets.

To avoid a recurrence of this in 1981-82, the committee, chaired by DfES assistant secretary Mr Stephen Jones, proposed a safety net to ensure that no individual authority faces a disproportionate rate burden as a result of a cut in their allocation.

The paper says: "We are convinced of the need to mitigate the most acute effects of changes in aid and chairman of the Aeronautical Research Council."

rate precepts and for major maintained institutions providing AFE, which clearly suffered sudden and largely unforeseen revenue budget cuts.

If it had been in operation this year, the paper says, nine authorities would have been caught by a safety net limiting losses to a 1p rate. In not case, an extra cost of £5m would have had to be spread among the other authorities. The paper suggests that the final decision on where to fix the safety net be left for political decision. It suggests 1p, 0.63p or 0.5p.

To ensure that local authorities submit realistic estimates next year, the committee proposes that their bids should be compared with their average spending per student in previous years. Any increase in average costs would automatically be reduced. In addition, rolling year-by-year funding would be introduced to correct mistakes in the allocation of funds from the pool.

The committee believes that its package is the best solution for next year's funding. But it says that the three elements need not be introduced together.

The document adds: "A rational and equitable basis for the sorts of judgments needed is not yet available, nor will be for 1981-82. We present our report in the view that our proposals represent the next best thing—a considered, though as yet unfinished, reasonably equitable and defensible method for next year's allocations that will be susceptible to later corrections of claims that will limit unit cost movements, and that will prevent massive changes in one year in any authority."

But the report is not unanimous, and the committee will hold more meetings before offering advice to ministers. A minority report by Mr Peter Flowerday, secretary of the Committee of Directors of Polytechnics, castigates it as "a sophisticated marginal tinkering" with an outmoded financial system.

Advocating an end to local authority responsibility for higher education funding, Mr Flowerday's report contains scathing criticism of this year's handling of polytechnic spending by central and local government.

Spending cuts spare science but slash adult education

Public expenditure on higher and further education will fall by just under 5 per cent over the next four years, about the same as all public expenditure but below the 9 per cent cut planned for education as a whole.

The latest White Paper on public expenditure shows that higher and further education's share of recurrent expenditure will fall from £1,755m (at last year's prices) in 1980-81 to £1,670m in 1983-84. Capital spending will be cut from £173m next year to £150m in 1983-84.

However, the outcome for higher education could be even bleaker than these figures suggest. Mr Carlisle, the Secretary of State for Education and Science, said that these figures allow for big savings in full cost fees for overseas students. If these students do not turn up in sufficient number, universities and polytechnics will suffer worse cuts.

The White Paper assumes that the total number of home students will remain constant—an assumption that is challenged by many

vice-chancellors—and that this will actually require a small drop in the size of the increasing size of public intake.

Spending on adult education will be hit much harder. It is planned to reduce it by a third, or about £15m to a full year. However, the Government hopes that this saving will be achieved by higher fees and that the present total of two million adult students will not be reduced.

In contrast the science budget has escaped. Spending will fall from the current year's total of £208m to £202m next year but then rise to a new plateau of £310m for the remaining years covered by the White Paper.

On unit costs the White Paper says: "For home students the pence provide for a small reduction throughout the period in expenditure on institutions and student support, especially in the non-university sector."

The Government's Expenditure Plans 1980-81 to 1983-84, Cmnd 7481, HMSO.

Working people poorly served by part-time courses, says TUC

The traditional pattern of higher education, with its emphasis on school leavers, has led to a gross neglect of the needs of working people for part-time courses, the Trade Union Congress told MPs this week.

Grants for part-time students should be considered immediately, TUC representatives told the Select Committee on Education, and in the long term a comprehensive system of adult educational centres, linked to mandatory grants, should be introduced.

Universities came in for particular criticism in the TUC submission. "Whereas the Open University has effectively combined home-based learning with short summer schools, there are few universities where part-time provision is given any priority whatsoever," it said, adding that Manchester, London and Glasgow's thriving extra-mural departments represented welcome exceptions to the rule.

Over the past 20 years, the proportion of part-time university undergraduates has fallen from 7.1 per cent to 1.67 per cent, the TUC pointed out. In 1976-77 only 3,812 part-time students were studying for first degrees and 15 universities had no part-timers at all.

The unions favoured the development of an overall policy for education, coordinating both sectors of higher education with non-advanced further education and the schools. At an institutional level, they wanted community involvement at every level of planning.

But Mr John Morton, general secretary of the Musicians' Union, said the TUC would not support a greater emphasis on the vocational element of higher education. It should be sufficiently broad to meet the educational needs of tomorrow, he said.

AUT talks

from front page

● points out a number of technical but fundamental objections to surveys and the way data has been processed

● underlines the reliability of data by referring to the discrepancy caused by the wrong decision of one job and its effect on a rank order

● recalls that the union has not yet received the rank order prepared by the management consultants and "feel free" — a requirement laid down by Professor Carlisle

NATHE believes that the rank order will be agreed on early in the "thickening up" process

that the omission of five jobs from the rank order — including a company director and a further manager — by the consultants further undermines the balance of the survey

Professor Clegg has not yet received the rank order from the teachers' leaders that the union was only the first processing of the data, and that any error made would be corrected by a wider range of consultation

A dispute over another company study — the internal audit settlement for local government — white collar workers could spill over into the public sector

The National Association of Management Officers' Association members in polytechnics are authorized to use industrial sanctions being applied to the breakdown of employees in local government

implementation of the study

Bristol may start careers levy

Bristol University has asked the board of its Careers Advisory Service to consider making charges to both students and employers.

No decision has been made but the board has written to about 220 employers inviting them to make a voluntary contribution to the service.

The letter pointed out the gloomy financial situation and asked if they were prepared either to make a donation or to consider a service fee for an interview or group of interviews.

No employer was prepared to pay, but donations amounting to several hundreds of pounds have been received.

The Careers Service, which is currently fully funded by the university, costs £102,000 a year to run. In 1979-80, the last year for which figures are available, 3,112 students and 210 employers used the service. There were 3,609 interviews and 45 careers talks. Usage has increased since then. There are six careers staff, plus secretarial help.

The suggestion to make a charge for the service will now be considered in a series of consultative meetings with careers staff, students, employers, as well as outside bodies such as the Careers Service Unit, a national service which all universities and polytechnics subscribe, and the Standing Conference of the Employers of Graduates.

Any decision in charge would have to be made throughout the

university world. All universities have some form of careers advice service, which has traditionally been recognised as an essential university function which is free.

Other careers services would feel a "dangerous precedent" was being set if the decision was made. Two views that have been expressed at Bristol are that either charging would put the service at a disadvantage to others, or that people would be more confident, on the basis that a service paid for is often assumed to be better than one provided free.

A spokesman for the university said that every department and vice had been asked what they could cut out and whether there could be charges for some services.

"There are national disadvantages which have to be taken into account and no decision will be made until the end of the year. Nothing will be done precipitately. No one has been charged a fee yet and we are not going to change in any light and easy manner."

Mr Paul Barker, president of the students' union, said he was worried about the suggestion, as the careers service was an integral part of the university.

"This could be one step towards charging for a seminar. The service is just one of many services the university offers. We think this would be a very bad step for the university to take," he said.

Carlisle hints at fees review if numbers fall

by John O'Leary

The Government will review its policy of introducing full-cost fees for overseas students if there is a dramatic fall in recruitment. Mr Carlisle, Secretary of State for Education, told MPs this week.

But Mr Carlisle said he did not expect this to be necessary and he will consider the fee increases as the best method of making the necessary savings in education.

He told the Select Committee on Education that the decision had to be made in the context of rationalising higher education as a whole, which would be needed to ensure that the necessary opportunities remained for home students and a period of level funding. Over 5,000 places had already been designed for

Britons during the year 1977-78 he said.

Mr Carlisle was elusive on the question of possible measures to reduce the "hormonal" effects on recruitment. Although he revealed that £40m had been set aside for contingencies when the two levels were set, he held out little hope for countries pleading special cases and he stressed that it would be the best method of making the necessary savings in education.

He quoted the School of Oriental and African Studies as one example of an institution whose special criteria might apply in the UGC's deliberations. But he stressed that in general, those courses which continued on back page



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Training cuts 'hit single A-level girls'

by Charlotte Barry

The number of girls with one A level entering full-time higher or further education has diminished as a result of the teacher training cuts and changes in the entry requirements.

This is the main finding of a report published today by the Equal Opportunities Commission on the effect of the teacher training cuts on women's opportunities.

It shows that during the 1970s the proportion of girl school-leavers with one A level going into full-time higher and further education fell by 24 per cent. By comparison, the proportion of boys in the same category fell by only 9 per cent.

This was the direct result of the teacher training cuts, the subsequent raising of entry qualifications and the failure of the Government to

provide suitable equivalent opportunities, the report says. Those with one A level who would have entered teacher training were mostly women, and many were working class. They found they were excluded from alternatives, that were mostly degree or other courses with two A level entry requirements.

Although Higher National Diploma courses for students with one A level were supported by mandatory grants after 1975, they were predominantly in scientific, engineering and technological subjects which require mathematics and science. These were subjects for which girls had been totally unprepared at school.

Social work courses were open only to older students, there were no courses in arts subjects and very few in languages at this level, and the few places available in the

visual arts, music and drama did not carry maintenance awards. Ironically, the alternative courses set up for those with two A levels in universities, polytechnics and the new colleges of higher education drew away the better qualified students, leaving the remainder to keep as part of the new national unit to upgrade the teaching profession.

The report recommends that the Government introduce a DfHE with one A level entry in arts and social sciences supported by a mandatory grant which could provide a ladder from this level to a degree.

The study, which was carried out by Ms Ann Bone while she was a research fellow in the Centre for Institutional Studies at North East London Polytechnic, took a year and was backed by a £4,000 grant from the EOC.

Its findings confirm long-held

suspicions, and the commission will be demanding that the Government also review the grants system which it considers discriminatory. "The mandatory grants list includes a lot of courses like HND that are predominantly patronized by men and similar courses patronized by women do not carry mandatory grants," said Mr Eric Robinson, the EOC's education commissioner and principal of Bradford College. "It means that men in higher education are better off than women."

He added: "The idea that numbers will even up in higher education over the next few years is not what we think is going to happen. We think women are going to continue to get a poorer share and not this change is very much to get this changed."

Sex and the single A level, page 8

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Staff unite for day of action

University unions are holding their own day of action against cuts in spending on May 9-10, days before the TUC's own demonstrations.

The executive of the Association of University Teachers has today for campus meetings to discuss cuts and bring home the commitment the universities' work towards the country as a whole.

Union leaders are approaching other university unions, including the National Union of Students, at a national level to bring about action.

Support has already come from the Association of Scientific, Technical and Managerial Staff, which has however warned its members in the universities that cooperation with the AUT should not be regarded as an alternative to taking part in the TUC day of action on May 14.

The AUT is also mounting an exhibition of university research work as part of the TUC's April 25 festival on education and the arts.

Sixth forms 'need re-examination'

Education authorities should examine the effectiveness of sixth forms and seriously consider arrangements with other schools for further education, says Mr R. Macfarlane, under secretary of state at the Department of Education and Science, said this week.

Addressing the Secondary Heads Association's annual conference in Oxford, Mr Macfarlane stressed that there would always be a place for the traditional sixth form.

"No authority should reorganise its provision for this age group merely for the sake of change. But authorities have to attend to the urgent question of how to provide an effective service in the face of falling rolls," Mr Macfarlane said.

The alternative was to take a look at educational provision for 16-18 year olds, offering more vocationally orientated subjects.

Bath goes ahead with expansion

Bath University, after a series of stops and starts, has finally begun the work on a new £750,000 building. It will house the school of modern languages and the school of education, and will also provide a central control for the university's research.

The work of the Lancaster Wave Power Team is financed jointly by the Department of Energy and Sea Energy Associates Ltd. The team plans to spend £164,000 developing the CLAM (illustrated above), a floating turbine capable of generating electricity from the flow of a river or sea.

Development of the CLAM follows experiments in Loch Ness with an earlier device called the Seltor. The team claims that the experiments showed that a wave

power device 300 metres long would be a practical idea, although major cost and engineering problems would first have to be overcome. The work of the Lancaster Wave Power Team is financed jointly by the Department of Energy and Sea Energy Associates Ltd. The team plans to spend £164,000 developing the CLAM (illustrated above), a floating turbine capable of generating electricity from the flow of a river or sea.

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Poles defend their ban on lecturer

by Olga Wojtas
Scottish Correspondent

The Polish authorities have defended their ban on a senior lecturer's return to Glasgow University, maintaining that his appointment was temporary, and that he has returned to full employment at the Polish Academy of Sciences in Warsaw.

Dr Leszek Kukulski's resignation from his Warsaw post and the Polish Academy's acceptance of this in 1967, and Dr Kukulski's reported in a Scottish paper as saying he has no employment in Poland.

He left Glasgow two years ago for a sabbatical in Poland, but says the authorities have now refused to renew his passport.

Polish embassy spokesman Mr Andrzej Kozupski said it was the understanding in Poland that Dr Kukulski had come to Glasgow for a couple of years to help promote Polish studies. This had been accepted on various occasions as Dr Kukulski said various projects had to be continued.

"At first people didn't mind but then it changed," said Mr Kozupski. "In the meantime, the university had assumed he was a permanent member of staff, and perhaps he thought so, too."

But Mr Rod Lyall, president of the Association of University Teachers, which is opposing the ban, said: "Perhaps the Poles genuinely don't understand the notion of academic tenure. They think this is a post they can fill with whoever they please but it is a normal academic appointment."

But Mr Kozupski insisted Dr Kukulski was on an exchange. Hundreds of people were able to do his job, and to keep them in rotation would improve the quality of study. Poland had offered Glasgow two replacements to choose from.

But now the university of Glasgow becomes stubborn. It has got used to Dr Kukulski, he has a couple of friends there, they say it's either him or nobody."

Mr Kozupski said he would not question Dr Kukulski's ability or academic qualifications, but while a decade ago there were around 25 students studying Polish at Glasgow, there were only four last year. During the last year of Dr Kukulski's stay, "if the number of students is dramatically reduced, then there's something wrong. Either students are getting bored or the teacher isn't teaching properly."

Mr Lyall said this was an unjustified smear. Over the past few years there had been a decline in Russian as well as the surge in Polish. Dr Kukulski was appointed a senior lecturer by the university in 1977, which indicated that they were satisfied with his work.

It was inexplicable that Dr Kukulski was being kept in Poland, he said. He was not a dissident.

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Universities received unfair advantage over fees, MPs told

by John O'Leary and Paul Fletcher

Universities have been given an unfair advantage over the public sector of higher education, pointing out that full-cost fees for overseas students, the Association of Polytechnic Teachers has told MPs.

In a submission to the Overseas Development Sub-Committee of the Select Committee on Foreign Affairs, the APT has cited the differential between the minimum fees laid down for universities and the levels imposed on the maintained sector, and the restriction on the Government's scholarship scheme for postgraduates as evidence of double standards.

"We are already experiencing the effects of the differential in fees between universities and polytechnics: overseas students who are seeking to change courses to the degree are opting for the lower-cost courses in universities even though this will entail a discontinuity in their studies both in content and location," the APT complains.

"The introduction by the Department of Education and Science of the postgraduate scholarship scheme for universities but not for polytechnics is bound to affect unnecessarily the image which the latter has gained outside the United Kingdom."

Both the APT and the Association of University Teachers, which has also made a submission to the sub-committee, believe the increase in fees for overseas students is a result of the number of overseas students coming to Britain. The two unions agree that the greatest damage will be inflicted on the poorest students.

The APT also warns: "If we are right, and the increase to full cost



Dr Anthony Kenny: a warning to the Government

fees does effectively eliminate the intake of overseas students into polytechnics and other higher education institutions, then the process will be irreversible. Once these students have found other sources of higher education, and the evidence is that that is what is happening, then we must assume that these students will be lost to Britain for all time."

In the APT's view, too, the scholarship scheme is inadequate, because the awards will not cover the full cost of tuition, unlikely to give proportionate benefits to the poorest students.

The scheme does not pay nearly enough in amount of award, or numbers of awards, to cancel the disincentive effect of the increased fees," the union says.

Oxford colleges could be turned into international communities in parochial institutions if the Govern-

ment persists with its stand on overseas student fees, the Master of Balliol College, Dr Anthony Kenny has warned.

Dr Kenny has written to Dr Rhodes Bysshe, the Under-Secretary for higher education, pointing out that Balliol now expects a fall of 20 per cent in overseas applications and admissions.

Graduate and undergraduate admissions during the past Michaelmas Term have fallen from 42 to 29 compared with the same term last year, a drop of almost 30 per cent.

Dr Kenny, who is also Chairman of the Conference of Colleges of Oxford University, says that British universities are pricing themselves out of the market.

"Even a dozen overseas students can provide a leave of variety and maturity to a Junior Common Room," he says. Oxford colleges would suffer a net loss of fees because they are not allowed to take on more British students, but the effect would be "marginal".

Dr Kenny says he welcomes the Government's decision to allow universities to submit evidence on the effect of the policy for 1980-81, before fixing the level for future years.

"The Methodist Church has also added its voice to the growing opposition to overseas students fees. The Church's Division of Education and Youth says the policy goes against the church's continuing commitment to students from poorer countries."

In the long run, it says, it will be dangerous for future peace, unity and prosperity if overseas students are turned out of British universities whose values are alien to the British way of life."

The programme is being hosted by the universities of Bath, Bangor, Brunel, Cardiff, Exeter, Loughborough, Salford, Sheffield and Southampton.

Welcoming the scheme, Mr George Barnett, said: "Engineers, like professional physicists and chemists and accountants and actuaries, are drawn from a relatively small group of highly numerate people."

"As yet in Britain—unlike snail of our European competitors—engineering is only beginning to attract its fair share of young women entrants with these talents, perhaps because parents have outmoded prejudices against engineering as a career for women."

Girls taking part in the insight programme will find out there are 16 different fields of engineering and that the profession offers a wide variety of opportunities in research, design, development, production, construction, marketing or management.

Scotland to host handicapped AGM

Mr James Allen, director of the National Bureau for Handicapped Students, visited Scotland this week and had discussions with Dr John Jackson, the bureau's Scottish regional organizer, and a lecturer at Strathclyde University.

The bureau has decided that Scotland's progress is so outstanding in this field that the next annual general meeting will be held in Edinburgh, the first time it has been held outside London.

There has been advanced thinking backed by money in Scotland," said Dr Jackson.

New University of Ulster

The New University of Ulster of Coleraine was notified from the list of higher education institutions in the Province offering courses leading to a professional teaching qualification given in an official printed in the TIMES dated March 14.

In fact Coleraine offers a variety of courses leading to a three- or four-year BA or BSc in education, four-year single and combined honours degrees in education, and a wide range of postgraduate degrees including both an honours degree in academic teaching and a professional teaching qualification.

APT, which represents polytechnic staff, is located in a building with the 70,000 sq ft NATFHE, which represents all college lecturers.

Gowrie makes no promises for Youthaid

by Patricia Santinelli

The Government cannot guarantee an automatic expansion of the Youth Opportunity Programme to match rising unemployment, Lord Gowrie, minister responsible for youth at the Department of Employment, has told Youthaid.

Lord Gowrie was replying to a letter from Clare Short, director of Youthaid to the Secretary of State for Employment seeking assurances that special programmes for the unemployed would be established in the present economic climate.

Ministers would consider whatever recommendations the Manpower Services Commission made, Lord Gowrie said. "But before undertaking further increases in the programme we would need to look at the level and type of need for YOP provision arising from any higher level of unemployment that might occur and at the MSC success in providing for that need."

Defending the quality of YOP provision, Lord Gowrie said the Government was not playing a numbers game. Improvements had been made in the current year and more would follow. There were three ways by which the quality of the programme was being improved.

One was the better balance of YOP schemes with a growth in the number of these other than Work Experience on Employers' Premises (WEEP). This meant that the less able or motivated youngsters could choose from a growing variety of schemes offering intensive help and support in the transition from school to work.

The second improvement was in the areas of training to which the MSC was devoting a large proportion of resources, for example by increasing the proportion of young people on work experience opportunities who were given access to further education. In addition the commission was working with City and Guilds to provide courses for the training of sponsor staff who dealt with these young people.

Quality of the programme was also being enhanced through better appraisal, monitoring and support for schemes and this experience was being codified in a guide to best practice.

Lord Gowrie dismissed as a marginal problem the idea that WEEP was being used by employers as a means of cheap labour or a way of substituting for normal employment.

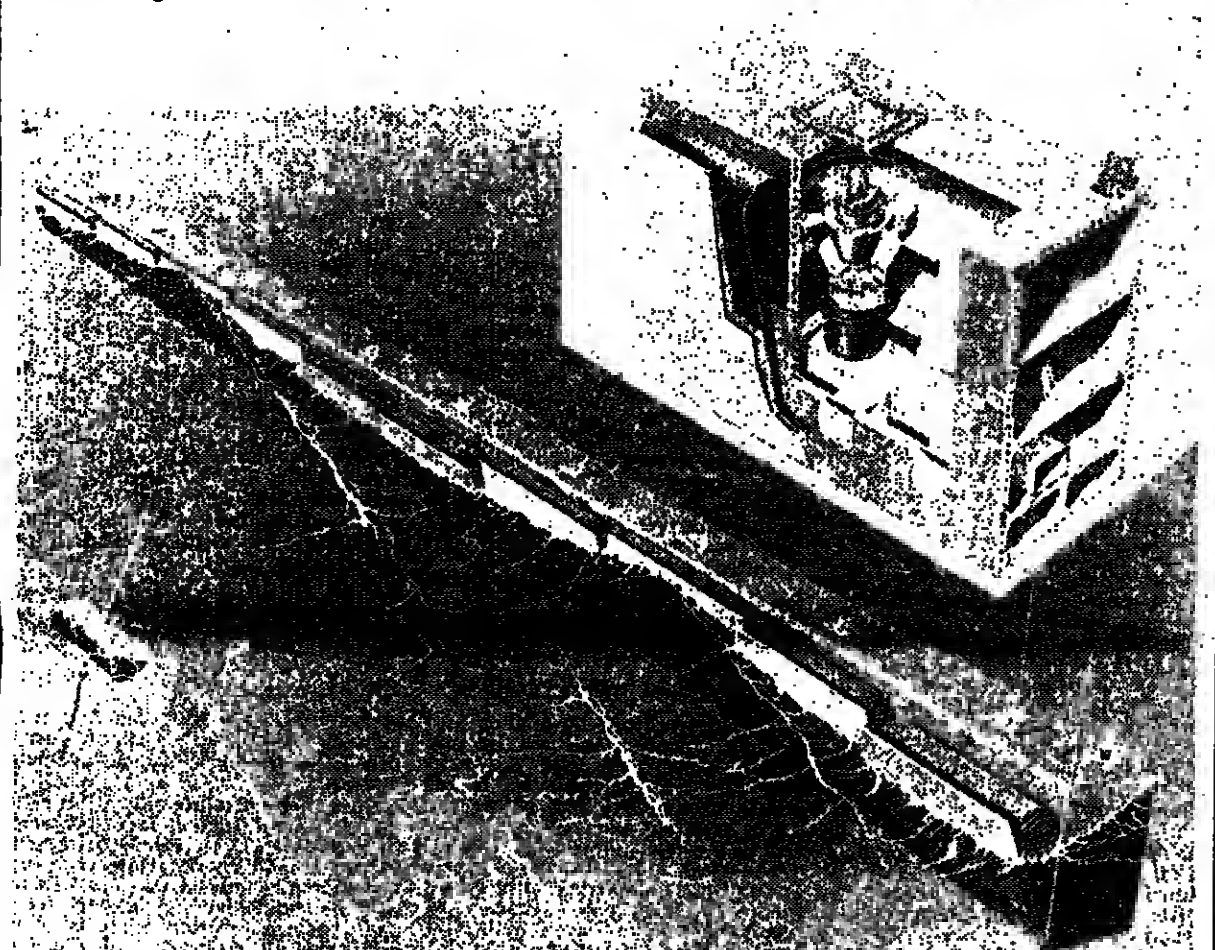
'Young worker' packs sent out

Schoolleavers looking for work or training opportunities are the target of a new education pack in the British Youth Council's public education series released this week.

The "Young Worker" pack, although primarily aimed at youth clubs is also intended for schools, further education colleges and youth centres.

The pack contains posters, leaflets and a simulation game on a variety of issues including trade unions, unemployment and training.

Poly tries to rule the waves



Coventry (Lanchester) Polytechnic has won research contracts worth £25,000 to expand a project aimed at extracting energy from waves. The polytechnic's 15-member Wave Power Team is devising a "CLAM", a floating spine capable of driving electrical generators.

The CLAM (illustrated above) consists of a series of floats hinged together in a floating rectangular spine. Between each float and the spine there is an air bag feeding into the hollow spine via

a turbine. The action of the waves closes and opens the flaps, driving air from the bags through the turbine. Air pressure in the spine allows the bags to ride between waves and the turbine operates continuously with the air flow in both directions.

Development of the CLAM follows experiments in Loch Ness with an earlier device called the Seltor. The team claims that the experiments showed that a wave

power device 300 metres long would be a practical idea, although major cost and engineering problems would first have to be overcome. The work of the Lancaster Wave Power Team is financed jointly by the Department of Energy and Sea Energy Associates Ltd. The team plans to spend £164,000 developing the CLAM (illustrated above), a floating turbine capable of generating electricity from the flow of a river or sea.

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Agency wins battle for literacy unit

Nine thousand adults received tuition during the three-year life of the Scottish Adult Literacy Agency, reports SCALA in its newly published final report.

And its main recommendation, to set up a national unit to continue and develop its work on its demise, has been accepted by the Scottish Minister for Industry and Education, Mr Alex Blaxter.

SCALA was established by the Scottish Secretary for two years in 1975 with a later extension until 1979. Now the Scottish Adult Literacy

Paul Flather on Cambridge's triennial admissions conference

Cutbacks better than lower standards, says Cambridge V-C

Contraction in the university sector over the next five years will lead people to talk of closing some universities, Sir Peter Swinnerton-Dyer, vice-chancellor of Cambridge University, warned last week.

The need to save money will dominate university thinking, and over the next 15 years this will mean fewer staff and fewer places for students, he said at the conference on admissions in Cambridge.

"But this is much better than damaging the quality of universities," he said.

Sir Peter warned that people—senior people—would increasingly start talking about closing some universities. The president of the Royal Society, Lord Todd, had already hinted at closures in the long run.

The number of "obscure" courses at universities would not be reduced, though student places on such courses would be cut. The first test in this had come from the Atkinson Report, which recommended reductions in Russian studies at 19 universities.

He said most vice-chancellors would now support a quota system on overseas students, as suggested by the last Labour Government instead of the present policy of charging overseas students full tuition fees.

The quota system had been attacked as a breach of academic freedom, "but most of us now wish we had had a quota system," he told an audience of 450 head teachers.

The Government—characteristically operating with market forces—has not listened to what vice-chancellors had to say on the matter. It is going to a kill-or-cure basis and is not certain which of its two targets it will end up with," he said.

But he doubted if the full effects of the new policy on overseas students would be as bad as predicted. Previous fee increases had not produced dramatic falls in overseas student numbers.

"It would not be too surprising if everyone was wrong again," he said. Some graduate courses—including the taught MSc courses—would have to be cut at Cambridge, but the university would not be badly affected because of its low proportion of overseas students.

Sir Peter went on to attack the Finliss report on the training of engineers as "lamentable and disastrous". It had been written by a "one of the worst of the old-fashioned view that mechanical engineering existed by itself. It took no account of chemical, biological or computer-based engineering."

It would be a disaster to have greater uniformity in engineering courses as suggested in the report, said Sir Peter. But he urged teachers to push students who wanted to study mathematics and natural sciences into studying engineering instead.

The gap then created for mathematicians and scientists should be filled by pushing girls away from arts towards science, he said.

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Industry offers £500 incentives to graduates

by John O'Leary

Graduates are being offered incentives of up to £500 per year to go into certain areas of industry, a career officer has revealed.

Mr Neil Scott, director of the Careers Advisory Service at Nottingham University, has urged a "free market response" to particular shortages for the first time.

Writing in the Department of Employment magazine, *Employment Gazette*, he says: "Firms in manufacturing industry appear to be offering up to £400 per annum more than other employers while the premium for mechanical or electrical engineers can be up to £500 per annum."

In general, salaries are likely to be 13 per cent up on last year's starting averages, far graduates, remaining at around 70 per cent of adult non-manual wages. The forecast for September is £4,485, compared with the actual average of £3,710 last year.

But with the demand for engineering graduates running at roughly twice the supply, special measures have been taken to attract candidates. Demand is running strongly in favour of the "numerate and scientific" graduate with the emphasis on applied skills rather than pure subjects, Mr Scott says.

"It is difficult to draw any other conclusion from the evidence but that there is scope for continued expansion of the higher education system, though on a more discriminating basis than the Robbins formula dictated," he writes.

A decided shift in emphasis is needed if the universities and polytechnics are to meet the changed and changing demands now being made upon them."

Declining prospects for teachers, both in schools and higher education will help swell the number of graduates on the employment market this year, Mr Scott believes.

He estimates that although numbers graduating from first and higher degrees will rise by about 4 per cent, the increase in those seeking jobs might be double that.

Mr Scott foresees a marked decline in the number of graduates going on to higher degrees or further training.

"A complicating factor here is that many good students in the sciences who might previously have aspired to enter university teaching are inclined to accept job offers elsewhere at first degree level and prospects have been sharply curtailed."

In teacher training some places on Post Graduate Certificate in Education courses are expected to remain unfilled for a second year. Mr Scott ascribes this, too, to "student perceptions of the post as uncertain future within the teaching profession" and flags that the critical response in mathematics and science puts future supply at risk.

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North American News

Framework for government relations with the campuses

from Clive Cookson

WASHINGTON

After a two-year study of the deepening tensions between higher education and the government, a bipartisan panel drawn from the university and business communities has come up with a set of recommendations to soothe the "increasing bitterness and pessimism on both sides".

The Sloan Commission on Government and Higher Education (so called because it was set up and financed by the Alfred Sloan Foundation) recommended: major changes in the way Washington regulates colleges and universities, particularly in the two areas where institutions find the regulatory burden most onerous: enforcing the equal opportunity laws, and auditing government-financed research.

The 22-member commission also urged Congress to overhaul the present system by which the government distributes financial aid to students. It wants Congress to stop subsidising student loans and spend the money, instead, on bigger grants for low-income students.

The relationship between state governments and higher education was examined too. Here the Sloan Commission made one particularly controversial recommendation: "That each state arrange for a periodic review of the quality of educational programmes at every public college and university within the state."

The report went on to imply that such reviews could be used by states to close down unsatisfactory public institutions.

Carl Kaysen, Professor of Political Economy at the Massachusetts Institute of Technology, took three years to leave the government to direct the commission. Dr Kaysen was previously director of the Institute for Advanced Study at Princeton. Here are some of the commission's recommendations in more detail:

● A new federal agency, the Council for Equal Opportunity in Higher Education, should be created within the Department of Education to enforce all equal opportunity, affirmative action and anti-discrimination laws. It would bring together the 17 different laws forcing institutions to give a fair chance to women, racial and ethnic minorities, which are currently administered by eight different agencies, and it would, the Sloan report says, reduce the existing bureaucracy by consolidating "sprawling and conflicting procedures" to get government grants or building up speculative projects.

● The productive capacity of the research universities would be greatly helped if discretionary federal funds were made available to give a fair chance to women, racial and ethnic minorities, which are currently administered by eight different agencies, and it would, the Sloan report says, reduce the existing bureaucracy by consolidating "sprawling and conflicting procedures" to get government grants or building up speculative projects.

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National Science Foundation to keep track of all federally supported research in universities—at present institutions are audited by the government department which supplies them with their research funds, and usually that means the Department of Health and Human Services, whose representatives often have little experience in dealing with research institutions, receive limited training, and typically stay on the assignment only briefly. The new agency, on the other hand, would develop a corps of federal auditors, sophisticated about scientific research and how research universities operate."

As the national commission on research made clear in another report issued last week accounting for research funds into becoming one of the most serious sources of friction between Washington and the universities, Government auditors accuse institutions of sloppy financial administration—occasionally verging on fraud—and the universities claim that complex and unworkable methods designed for industrial procurement.

The greatest cost of excessive oversight is not the burden of paperwork, according to the Sloan commission, but its potential effect on the research process itself. If close financial oversight requires the investigator who has a novel idea to interrupt research to get approval for budget changes, or to lay down a trail of documentation and, later, to justify the change in plans to auditors, it can mean that new ideas are not followed while the new less fruitful, original plan is. This result is entirely self-defeating.

The Sloan commission made several other recommendations to improve federal support of university research. For example, it suggested that the government spend \$100m a year over the next decade to carry bright young researchers through the great depression in the academic job market.

This would pay for 1,000 "national postdoctoral fellowships", renewable for up to four years, and 300 "national research fellows", renewable for five years. Similar proposals have been made by other study groups recently, but the Carter Administration has not yet responded to them.

Another recommendation is that every federal research grant and contract should carry with it an additional 7 per cent of its value in discretionary funds, which the university could spend on any research project it wanted.

For example, supporting promising young researchers with discretionary funds would be a good way to get government grants or building up speculative projects.

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Freshmen's test results make depressing reading

from our North American editor

WASHINGTON

Charges that today's young people are poorly educated and counterclaims that the schools are better than ever tend to be carried on without benefit of facts. Missing from the debate is a yardstick, by which to measure and compare the performance of students—then and now.

One such yardstick has just become available, and it shows that apprehensions about the decline in reading skills may be fully justified. The instrument that provides the disconcerting evidence is a test given to 865 incoming freshmen at the University of Minnesota in 1928 and again in 1978. The comparative results, which have just been correlated, are as follows:

In the 1920s Alvin C. Eurich, now president of the Academy for Educational Development, a non-profit organization of educational research and services, designed experiments to improve the reading abilities of freshmen.

At the time, as a research assistant in educational psychology, he prepared and administered two standardized reading tests.

In the intervening years, Eurich has served as a professor and ultimately as acting president of Stanford University, a Navy Commander in charge of a testing and training programme, chancellor of the State University of New York and head of the Ford Foundation's education division.

While listening to the debate over student performance, Eurich recalled his Minnesota test experience and decided, with the university's cooperation, to administer the same tests to the 1978 freshmen. "The conditions," he said in an interview, "were especially favourable for a comparison."

Then, as now, the university had open admission for any graduate of an accredited high school. In 1928, moreover, the tests were administered not only to the 1,313 freshmen in the liberal arts college but to 4,131 high school seniors in the Minneapolis and St Paul public schools.

A spot check of the test by *The New York Times* indicates that the meaning of the words used on it has changed little, if any, since 1928.

In the 1978 rerun, only college freshmen, both in the more selective college of liberal arts and the new general college, were tested. Today's college freshmen failed to score as well as the 1928 samples—college and high school.

The first of the two tests consisted of two parts: a vocabulary test in which students had to define 100 words by selecting the correct meaning from five choices, and a reading comprehension test, which asked students to select, from a series of statements, the one that correctly interpreted a paragraph.

In the second, a "speed of reading" test, students were allotted six minutes to read 38 paragraphs, and were required to cross out the one extraneous or absurd phrase in each paragraph.

On the vocabulary test the 1978 freshmen scored significantly lower (26.75 out of 100) than the 1920 freshmen (34.90). Approximately 50 per cent of the 1978 freshmen scored below 26, compared with only about 40 per cent of the 1928 freshmen. (The figures used are derived from the mean scores based on the number of items answered correctly by the tested groups.)

In reading comprehension, the pattern was similar. About 50 per cent of the 1978 freshmen fell below a score of 12, compared with only 40 per cent of the 1928 high school seniors and 30 per cent of the 1928 college freshmen.

In the speed-reading test, about 54 per cent of the 1978 freshmen scored 20 or below, the 81 per cent of the 1978 group did so.

Critics of the comparison say that no two samples separated by 50 years can be considered truly comparable, which Eurich concedes. For example, in 1928 a considerably smaller proportion of students finished high school and went on to college. Thus, the sample tested that year was more select—many low achievers had already dropped out.

Still, Eurich's findings block any defence that may try to absolve schools and society for the decline in reading achievement on the fact that today more not-so-bright youngsters make it all the way to college. Most striking, he said, is "the noticeable decline by 1978 in the performance of the top 1 per cent of students—the top 1 per cent."

In 1978, he said, no student scored higher than 75, a drop of some 20 points from the highest score in 1928—and only one student out of 100 in 1978 scored near 60, a score obtained by five out of 100 in 1928. The top 1 per cent in academic ability within the student population is fair game for often-endless comparison.

In addition, Eurich points out, while in 1928 all students had to take the test, today's liberal arts college freshmen required reliance only on those who volunteered—with the likelihood that weaker students would balk at participating.

What does all this mean? To Eurich it means that freshmen today cannot do as well as such good students as students half a century ago, or comprehend what they read as well.

Indications of students' declining test scores over a shorter period of time have led to much guesswork at the reasons without many convincing conclusions.

Eurich is content with raising some questions: "Can it be that we are placing less and less emphasis on the importance of reading and other more traditional modes of learning?"

He asks, "Is the technological revolution, with its emphasis on communication, making us become 'bedlines' learners, giving less and less attention to substance and the beauty of language?"

Dr Gillipie is a member of what he calls "the first generation" of scientific biographers of science. He is a former Princeton colleague of Thomas Kuhn (a member of the editorial board of the dictionary) who helped the history of science to get established as a separate well-defined discipline after the war.

Science and technology in eighteenth and early nineteenth century France are Dr Gillipie's special interests. He wrote several of the dictionary's entries in this field.

Women adapt to pressures

Women undergraduates settle into the pressures of Cambridge University life with far greater ease than the men, the conference was told.

Dr Kate Pretty, lecturer in archaeology at New Hall College, and organizer of the conference, told the assembled ranks of school headmasters they should also think about how well pupils could cope with Cambridge before trying to get them in.

She said women seemed more able to adapt their clothing, even more their accent up or down, to suit the mood of the university. Perhaps this was because they were more "docile" or less ambitious, she said.

Mrs Pat Glavin, head of the university's counselling service, said that up to 400 undergraduates were referred to her or came to see her because of the "pressures and strains of university life."

At mixed colleges, it was often difficult for students to readjust after a broken relationship, knowing they would always bump into each other around the college.

Tutors urged to offer more conditional places

The university's admissions tutors were urged to offer more places on "conditional offers" based on A level results.

Headmasters and headmistresses from 450 schools, about 300 from the public sector, said it was no longer feasible to provide coaching and extra tuition for students who wanted to do the special Cambridge College Exam (CCE).

They blamed increasing staff-pupil ratios for the problem. It was not possible to provide any teaching beyond the basic A-level course and certainly not for the CCE, usually taken in the seventh term of the Sixth Form.

At present the university fills out of 10 places on conditional offers. This is becoming more common with advice applicants. Other students take the CCE after four terms, and are marked accordingly, or after seven terms.

Dr Alan Sharpe, admissions tutor at Robinson College, said the university could not cope with entrance based only on conditional offers.

"There is no substitute for applicants being willing to take a Cambridge set and marked exam."

Dr Kenneth Machin, admissions tutor of Queens' College, said the colleges were well aware of the problem. "We are of course unhappy at this sort of disqualification, but we have got it right but I hope we will get it right."

Mr Kenneth Brookmead, headmaster of the Alex Hunter School near Braintree, backed a system of entrance based on A-level entrance. "Very few of us have a tradition of sending pupils to Cambridge. We have sent boys and girls of promise to you but few have got the specialist treatment to get in."

Sir Peter Swinnerton-Dyer said he was very sympathetic to the problem. But as most applicants were on conditional offers, the university could not afford to do up all its places in advance.

Dr Rhodes Boyson, Under Secretary for Higher Education last week, pledged the Government's support for institutions committed to excellence.

Addressing the Oxford Association of University Teachers he said: "I believe, and the Government believes, in the development of individual excellence, and that the welfare and wealth of the nation ultimately depends upon this. We have no intention, through our financial policies, of impeding institutions which have achieved a high standard of excellence, and for so long that they too are dedicated to these same values."

He said that the high quality and the short length of British university first degree courses would continue to make our institutions internationally competitive.

Our degree courses of three years were generally shorter than those found elsewhere. Failure rates tended to be lower and the university staff/student ratio of 20 to 9.2 compared with one to 20 in France and one to 23 in Italy.

He spoke about the great distinction that Oxford and Cambridge had achieved and the contribution they had made to the life of the nation and the world.

"Looking at a table of statistics about Nobel Prize winners," he said, "I am not entirely surprised to note that in 1977 there

Overseas News Campus open again after clashes

from Hosan Akhtar

ISLAMABAD
The Quaid-e-Azam University at Islamabad has reopened after being closed for 79 days. The university was ordered to be closed on December 18 following violent clashes between groups of students who used revolvers and knives, resulting in injuries to a number of them.

Right-wing students were blamed for stirring the trouble. The prolonged closure has resulted in loss of one semester to the students and unless the university administration curtails next summer's three-month vacation, the students may have to put in three extra months to complete their courses of studies.

Meanwhile there are strong reports that the chancellor of the university, General Zia ul-Haq, president and chief minister, law administrator, has decided that the university should be restructured to revert to its original charter of specialized education. The current MSC classes in natural and social sciences are expected to be discontinued under a phased programme.

The Quaid-e-Azam University is not the only one which is facing uncertainty in its future. The Karachi University, regarded as the second largest in the country, after the Punjab University, is said to be seriously considering abolishing the present semester system and returning to the conventional system of education and examinations.

The academic council of the Karachi University is said to be waiting for a report of its committee on the issue. According to general view in the academic council, the semester system, introduced only a few years ago, had failed to deliver the goods.

It is being said that the university failed to work the system because of shortage of funds resulting in inadequate teaching aids and prolonged forced closure which disrupted the teaching.

The University at Multan, Central Punjab, is also subject of debate in Pakistani press. There is a strong controversy over the education in the university in this orthodox city of Punjab and many newspapers demanded exclusion of girl students from the university.

The Multan University administration is also debating whether to continue the present semester system which is apparently suffering from the same problems which are faced by the Karachi University.

Education experts appear to hold the view that education system in Pakistan since independence has been subjected to frequent tinkering, quite often for political rather than educational reasons. A leading newspaper commented: "The more our educational system is made to change, the more it remains the same."

It is recognized that education in Pakistan never received either the attention or financial support that it deserved from successive governments.

Rectors call for single repeat exam

from Mario Modiano
ATHENS

The committee of rectors of the 13 universities and graduate schools in Greece, entrusted by the Government to recommend a solution to the problem of examinations which led to a serious confrontation with students last December, has now submitted its report.

The committee proposes that there should be only one, instead of two repeat examinations for students failing in the year-end tests every June, but that they should also be able to transfer subjects in which they failed to the following year, so they would be given four chances to pass within two consecutive years. In graduation examinations two repetitions would be allowed, one in October and one in December.

It was thanks to the personal intervention of Mr. Karamanlis, the Greek Prime Minister, that a major crisis was averted in December. The Prime Minister suspended the controversial Law 815 and asked the committee of Rectors to work out an acceptable alternative, in consultation with the student leaders, and present it by mid-March.

The problem emerged when the Greek government decided to take drastic action to upgrade Greek university diplomas which have fallen into academic disrepute in Europe, built because of the quality of instruction and the facilities offered even to unqualified students to graduate.

Law 815 established the privilege of repeating year-end examinations twice in case of failure, in October and December, and prohibited the transfer of an unlimited number of subjects from one year's examination to the next. Finally, "perennial" students were to be ousted if unable to graduate in one and a half times as many years as were ordinarily required.

The students reacted against Law 815, arguing that it claimed too high standards that were not compatible with the shortage of teachers and the inadequacy of the infrastructure in Greek universities. When the ministry of education insisted, the students staged boycotts and later occupied the premises in all universities.

The committee of rectors is now proposing that besides the year-end examination in June, there should be only one repeat examination in October, and in the case of graduating students only, also one in December. However, those students who fail in subjects may transfer them to the following year. In the fourth attempt, any student suspecting discrimination may ask to be examined by a special committee of three professors appointed by the university senate. "Perennial" students, the rectors urged, should not be deprived of their student status, but this will only give them the right to participate in graduation examinations.

The rectors approved the proposal by 10 votes to three—the minority filed a report agreeing largely with the student representatives who had walked out of the deliberations. They argued that the problem of examinations could not be divorced from the overall need for university reform.

The student leaders deplored the problem should be approached in the context of the comprehensive legislation covering all higher education the government has com-

missioned the same committee to draft. Until then the existing Law 815 should be enforced.

The president of the rectors' committee, Professor Philis Mitsis, of Athens University, said universities and graduate schools would be allowed great flexibility in applying the basic principles of the two examinations. Transfer of subjects only to the following year, and no expulsion for students who are taking their time in obtaining degrees.

How the students will react to the proposal is not yet clear. Following the student elections on March 5, the tenth student congress has been meeting in Athens this week to elect the new leadership of the national student union, and lay down basic policies and discuss the student movement to this effect.

Professor Mitsis pointed out that this was the first time the government has given carte blanche to the universities to work out the problems with the students, and said he was confident he could convince the new national congress of the students to accept the rectors' proposals which were in their best interests.

Today Chinese higher education presents an entirely different face. Since the death of Mao Tse Tung, and especially since the rise of Deng Xiaoping, there has been a sharp change of direction. Now the ruling orthodoxy is the "four modernizations"—of industry, agriculture, defence and science and technology—originally conceived by Chen Lai but enthusiastically espoused by Deng.

As part of the fourth modernization the tough national entrance examination for higher education has been revived; courses have been increased in length and made more rigorous; and one university has been designated as a "key" institution in which good teachers and students are being concentrated and into which extra resources are being poured.

Indeed there has been an even greater reaction to the excesses of the years between 1966 and 1977. Certainly the swing back to standards and traditional standards into the bargain has been very strong. Chinese higher education and Chinese intellectuals appear to have more than made up for the years of neglect and deprivation. The present generation of academic leaders has been deeply marked by their experience of the Cultural Revolution.

To these two qualities, elitism and conservatism, it is necessary to add a third, ostentatiousness. Chinese higher education survives and apparently thrives in spartan conditions which a European or North American finds difficult to conceive. Students live in a room, sleeping in bunks draped with dry clothes. Many students' residences have no hot water, and libraries have few modern books and their shelves are filled with rows of textbooks. Their filling and retrieval systems are primitive in the extreme.

Laboratories have peeling walls and are filled with out-of-date equipment. Computers are at least ten years behind the latest models in America, Europe or Japan. Foreign exchange is so scarce that the few pieces of up-to-date equipment are treasured. Teaching groups are large, in spite of an apparently favourable staff/student ratio in many universities. Staff ways and corridors are badly in need of decoration. Buildings are cold and damp.

But it seems wrong to dwell for too long on these low material standards. The Chinese often seem proud that their higher education is not so far behind the rest of the world. They use this to justify the discipline of their higher education. The result is that their intellectual standards are high. Once they enter university or college they have to work very hard. They often spend five or six hours a day at their studies, and nearly all the rest of their time is spent in private study. They have neither the money, the inclination, nor perhaps the imagination to indulge in much leisure.

Mr. Jiang explained that in the Cultural Revolution students were encouraged to study to the point of exhaustion and to hand in blank papers in their examinations. Now

China's 636 universities and colleges today are in the middle of a restoration of high but conventional standards that leaves little room for radicalism; and a revolution in the growth of a new middle class and ended in indifference, demoralization, bullying, looting and murder.

But they are not at the brink of a Chinese Thermidor, however comforting that interpretation may be to observers in the West. Their grasp of the concept of averages and decimals and their ability to work them out correctly seemed much greater.

Second, Chinese higher education is super-selective. In all China there are only 1,020,000 university and college students, less than twice the British total although its population is 20 times as great. Mr. Jiang Nanxiang, the Minister of Education, told us that China had only nine students per 10,000 of the population, compared with more than 100 in Britain and 350 per 10,000 in the United States.

Last year 4,700,000 school leavers took the national university entrance examination, but only 275,000 were admitted. With a primary and secondary school population of over 200 million and single year cohorts of more than 30 million, this means that China has an age participation rate of just over half of 1 per cent.

Of course, there are important regional variations. In Shanghai, China's largest and most sophisticated city, 14,000 of the 140,000 middle (secondary) school leavers last year went on to higher education, so giving a participation rate not much different from Britain's. In contrast in Sichuan, China's largest province and mainly an agricultural area, only 18,000 students were enrolled in universities and colleges; 200,000 had applied and half a million had successfully completed middle school. The loss of figures represented by the minority of this relevant age group of about three million.

Sichuan by Chinese standards is so rich a province. There are many big cities, especially in the north-west and in the south-east like Chongqing and Chongqing. The province is rich in natural resources and has a long history of education. In so many other aspects of Chinese life, it is between the 20 per cent who live in cities and the 80 per cent who live on the land.

Admittedly Chinese students can be younger than their British counterparts as middle school ends at 15. But in practice pupils have to repeat years in school, and many aspirants to higher education have to take the entrance examinations more than once. Also there is still a residue of older students whose education was seriously interrupted by the excesses of the Cultural Revolution. So the average age of students appears to be fairly similar.

In any case Chinese students are trained in a highly disciplined secondary school system and have to endure much more of the discipline of higher education than their British counterparts. The result is that their intellectual standards are high. Once they enter university or college they have to work very hard. They often spend five or six hours a day at their studies, and nearly all the rest of their time is spent in private study. They have neither the money, the inclination, nor perhaps the imagination to indulge in much leisure.

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How Deng's fourth modernization endures its spartan quarters

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China's fourth modernization

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be gradual rather than dramatic," he said. Lack of staff and buildings, especially student residences (nearly all Chinese students live in dormitories), were important limitations on growth.

The predominant characteristic of Chinese higher education is not so much its elitism—in spite of the intense competition for places and the reintroduction of "key universities"—but its conservatism. The values of China's universities and colleges appear highly traditional in a country which is a controlled system under the unchallenged control of the Communist Party in which all academic acts assigned to their future jobs.

In any case this tripartite ethos of austerity, elitism, and conservatism creates two important difficulties. The first is simply that the designation of "key" universities has legitimated the existing hierarchy in Chinese higher education. The second difficulty is more fundamental: not only to Chinese higher education but to Chinese society. At present there may be no real alternative to a super-selective system of higher education (with an even more elite "key" sector within it) because of the great scarcity of resources. It may even be tolerated for a while in a society in which the submerged peasant population is effectively excluded from higher education through lack of proper, or any, secondary schooling.

However, if present policies are successful, demand for places in higher education will increase. Mr. Jiang told us that the most urgent priority today was to extend compulsory education to five, then eight, then 10 years (at present education is only available but not compulsory).

Higher education in China would then have to expand greatly if these new expectations were not to be disappointed. In these circumstances it might find it difficult to maintain its present style of a rather conservative, elitist, and elitist. But any change in style would disturb the peace and quiet of the intellectual, so, conceivably, the restoration of the Cultural Revolution.

Under Deng's restoration the position of the intellectual has improved, but it is still far from secure. They are protected from crude popular pressures by no authoritarian Government committed like them to technocratic values and by a disciplined ideology. But the government is unlikely to favour democratic tendencies in society (because the writing of big-character posters, the most obvious manifestation of the democratic spirit in China, evokes unhappy memories of the Cultural Revolution), or radical tendencies in higher education (because such a radical education would be a step towards the restoration of the Cultural Revolution).

This is not to say that there will be no change. The Cultural Revolution, simply that by the year 2000 Chinese higher education, like Chinese society, must have to face up to the discomforts and the opportunities of mass post-school education with an intensity that seems remote in 1980.

Today Chinese universities and colleges are seeking a balance between the collective right of relief after the trauma of the Cultural Revolution, that such thoughts appear either irrelevant or remotely disturbing. They make up a system with conventional and even familiar values but at the same time a commitment to the building of Chinese socialism that is intense and sincere. A system that places a high value on hard work and high standards, and a lower value on creativity and change. A system that has adopted a policy of "learning from the advanced" rather than a "learn from the masses" policy.

Next week: Qinghai University in Peking.

'How do you compare the values of a bishop and a heart-surgeon?'

Even the union leaders who successfully recommended reference of the lecturers' pay claim to the Clegg Commission found it difficult to work up any enthusiasm for the exercise.

After the national council of the main union, the National Association of Teachers in Further and Higher Education, agreed last June to refer the pay claim to the Clegg Commission, it was "sold" to the membership in very constrained terms.

The NATFHE Journal, the union's official publication, endorsed it in this way: "It is probably fair to say that further education is probably more unmovable in this technique (job evaluation) than are other areas of the education system."

While this was (and is) theoretically true, the disconcerting disclosures of the first hard results indicate that it signally failed to work out in practice.

Professor Hugh Clegg and his commission staff now have the tough task of processing the data derived from a number of sources into the shape which can be used as part of a report which can be negotiated within the Burnham machinery. The difficulty arises from the wide scatter of results indicating that while most school teachers should qualify for significant pay rises, only further education principals and vice-principals apparently deserve none.

In the middle ground of heads of department and senior lecturers the picture is mixed.

For the bulk of lecturers—the 60 per cent on grades I and II—appearances are truly gloomy. The Burnham management consultants' study on which all the findings are based leads to theoretical pay cuts of 6.6 per cent for the lowest grade lecturers, the median salary of £5,814. If the public sector is excluded the cut is only 3.9 per cent. If salary data from outside sources available to the commission are used, the rank orders are drawn up for the study, Lecturers IIs on the median salary of £5,873 could face a cut to under £5,000.

The unacceptability of such incongruous results as a basis for salary negotiations has been pointed out by union leaders and acknowledged by the Government, who have made clear to them that the data is crude, must be processed, and would in any case not be the sole factor in his commission will take into account when arriving at recommendations.

It is, however, not surprising that widespread enthusiasm there might have been has almost completely evaporated—a process which began to accelerate when it became clear that the commission would be unlikely to deliver an interim report or even guidance at Christmas.

Charlotte Barry looks at a report on the effects of cuts on women teachers

Sex and the single A level: giving girls a chance

A diploma of higher education course to those with only one "A" level should be considered to provide a second chance for the girls who have been excluded from full-time higher and further education by the teacher training cuts and changes in the entry requirements.

This is the main recommendation made by Ms. Anne Bone, author of a report on the effect of teacher training cuts on women's opportunities, which was published by the Equal Opportunities Commission last week. The wide-ranging study, which is based on a detailed analysis of official statistics, examines the effect of the cuts in teacher training on women's opportunities for higher education between 1970 and 1977, backed by three local case studies, was carried out while Ms. Bone was a research fellow at the Centre for Institutional Studies at North-East London Polytechnic.

It shows that during the 1970s the proportion of girls achieving full-time higher and further education fell by 24 per cent. By comparison, the proportion of boys in the category fell by only 9 per cent. This significant drop in the number of girls, the report says,

David Jobbins examines the minefield of pay relativities facing the Clegg Commission as it studies the case for college lecturers

The great fear that talks on the Clegg award and the 1980 pay negotiations would become inextricably linked seems to be justified. But it was also only too expected in the light of the tough financial line being taken by the Government that the local authority employers would not talk about 1980 while the bare line on which it would be cut remained to be worked out after Clegg reported.

The attractions of a reference to Clegg last June was obvious. It resolved what was likely to be an increasingly sticky series of negotiations with 20 per cent separating the two sides; as Nathan general secretary Mr. Peter Dawson has pointed out it gave lecturers cash in their hands (3.3 per cent plus £6 a month for nine months on account); and above all it offered a chance to demonstrate the startling decline in lecturers' pay in the light of an independent adjudicator.

A joint working party studying movements in pay, which reported last year, disclosed that the average further education lecturer would have needed an additional increase of 24.5 per cent in April 1978 on top of that year's award to restore the Houghton relationship with the salaries of all non-manual workers.

By the time the unions made their detailed submission to Clegg last October the gap had widened to 28 per cent and it was claimed that at least 20 per cent more would be needed to catch up with university lecturers.

Clegg also gave the lecturers the opportunity to point out the impact the apparent decline in relative pay was having on recruitment to specific grades.

The commission was told of a NATFHE survey in the summer of 1979 which revealed it was difficult or impossible to recruit staff in 18 subject areas including such crucial ones as engineering, building, electronics and computing because of the widening pay gap.

What was an apparently strong case. It is no wonder that disclosure of the Clegg raw data has added anger to the impatience felt by lecturers at the slow progress being made by the commission.

Mr. Dawson has agreed that NATFHE had doubts about Clegg's ability to employ management consultants to carry out a job evaluation exercise. But the association recognized the decision was

one for the independent commission, and agreed to cooperate on the basis of assurances that the results would be made available to the parties concerned, and that any findings required a high degree of consensus among those participating, he wrote.

The exercise has fallen into two halves. The failure to produce an interim report at Christmas derived from the unsatisfactory outcome of the first half—and the second effort to "thicken" up the early data led to even more trouble.

The idea was to compare the jobs of real teachers with a wide range of equally real jobs in industry, commerce and the rest of the public sector. The lecturers chosen to take part were given a week to fill in a six-page job description. The crucial "job factors" which individuals taking part in the exercise were asked to describe were: qualifications; training and experience; responsibility for people; responsibility for resources and decision-making; communication; and mental and physical demands.

Ten pages of guidance notes were provided to help with the form-filling—the language was that of pseudo-scientific industrial psychology, according to one of the lecturers involved. The job descriptions were then shuffled into a rank order by judges, paid to compose a list of "job factors" which had been rejected by the management.

When Mr. Dawson learnt that the crude data had been leaked he spoke out for the first time about the details of the exercise, warning that if Clegg came to the wrong conclusion it would be a complete chaos in further education.

"We have repeatedly stated our reservations and our very subtle criticisms of the way the study has gone. But we have been unable to get our message across," he said. "We are sorry to say our criticisms are justified because any report based on these figures would be a manifest nonsense."

The crucial question now is whether reprocessing can improve the results. Observers note that Professor Clegg may retain the school teachers' survey but ditch the lecturers' one in favour of other methods of determining relative values.

The other half of the study, in which a select group of lecturers compared their jobs with those of other professionals, was also leaked. Those who want to build up the status of the polytechnics, ultimately perhaps to put them on a par with universities, will find their own

jobs on this level could be made with some confidence.

But the task of comparing the Lecturer 1 and Lecturer 2 examples with the external comparison was far harder. There was little in common between the job descriptions.

One judge said: "It's like comparing a bishop and a heart surgeon. On such difficult terrain, it was easy to fall back on factors such as the perceived social status of the job—subjective factors which the exercise was intended to avoid—as the basis for judgments. It is felt this may be why lecturers in plumbing and printing found themselves towards the bottom of the pile—the teaching aspect of the work being disregarded."

The conclusion the union reached was that certainly for the two basic grades the rank order did not "feel fair", a requirement for Clegg wanted to achieve.

So agreement was reached to embark on a second stage—a "thicken up" of the data amassed at the end of the first half.

When it was obvious no interim report would be forthcoming the union immediately set to work to claim and settle for 7.5 per cent backdated to January 1.

If anything the thickening up process was even less fruitful. The judges met jointly instead of making assessments of individuals and sought to arrive at a consensus on where 29 extra jobs should be added into the 60-plus rank order.

In the event agreement was reached only on 10—and it led to public outburst from Mr. Dawson at what he described as block voting by the management which would reduce the exercise to a meaningless exercise.

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Official or alternative

Health, Medicine and Mortality in the Sixteenth Century
edited by Charles Webster
Cambridge University Press, £18.50
ISBN 0 521 22643 0

History of medicine is a fairly young discipline in this country, long avoided as technical by the historians. Among its growing pains has been the incident to youth, and has suffered from chronic conditions of antiquarianism (at the hands of relict physicians), whiggism (by those who divided history into geniuses before their time and lunatics behind theirs) and internationalism, the occupational hazard of those hard-nosed professionals who attempted to establish medicine's intellectual content and lineage. That schema has the weakness of treating medical ideas as intellectual genes, passing from generation to generation without ever producing the real animal of medical practice, a weakness that brought on an acute attack of sociology, in which it was proved that the animal did not need genes because it was explicable in terms of society, the ultimate cause of all. It is clear that the intellectual historians, who had tried so hard not to become whigs, had become most dreadfully elitist. The reaction to this modernist bias was a form of "alternative" history that might be called the "social grudge school".

Webster is doing a great deal to bring a mature judgment to the subject, largely from the viewpoint of a social historian. Health, medicine and mortality (in England, it should be noted) are topics that by their nature preclude an internal or intellectual history of "official" medicine, because there was precious little intellectual novelty in English medicine at the time (if we plausibly exclude Linnaeus and Celsus). It was, all in all, a derivative, and Webster's essay in this book gives us some account of circumstances at one of its sources, Padua.

"Official" medicine was available only to a very small proportion of the population, and its history is history of medicine only in a narrow sense: "alternative" medicine, whether osteological (discussed by Chapman), eichemical and Pacciolini (Webster), or the varicellous literature (Stock) or folk medicine, secured the bulk of the population, but has received less historical attention. Webster is trying to redress this imbalance. One result of this kind of study at the national level is an interesting celebration between forms of religion, national, geographical and humankind and "alternative" medicine.

Another way to cut across the sects in the subject and to give it

the feel of sitting on a firmer base is to use the non-pertinent quantitative method, already in use in French social history. The book bears evidence of strong editorial influence in the selection and presentation of material in graphical and tabular form, ideally suited, of course, to infant, epidemic and urban mortality (discussed by Slack, Schofield, Wrigley and Forbes) but perhaps not so necessary in the representation of the flow of venereal disease. The quantitative method is used to great effect in Pelling and Webster's account, based on a head-count in sample areas, of the different kinds of practitioners, from the quack to the qualified, and of their distribution, social and professional groupings and education.

As a social historian, Webster broadens the scope of medical history to include topics not necessarily concerned with medicine as such, the diet (Appleby), corruption in the administration of a lunatic asylum (Allender) and demography. These are proper parts of a history of medicine, but as we can see from these chapters, each is in an early stage of its own development, and the interdisciplinary cross-fertilization which all hope to see are not evident. We do not yet know what the diet of the poor was in the sixteenth century, and still less what affect it had on child or epidemic mortality; we do not know whether epidemic, acute chronic diseases of the time are identifiable; and we have little idea of the efficacy of medicine, whether official, alternative or quack.

That several component parts of medical history viewed in this way are at a preliminary stage is not to deny the excellent academic standard of these contributions, or the importance of the historical purpose that brought them together in what amounts to a statement of intent. The book is a social history of medicine, in such a programme we are beginning to learn what happened to the patient, hitherto almost forgotten in medical history. What happened to the patient also involves the equally ignored question of what happened to medical theory when the medical man entered upon a practical course of action in treating the patient. It is the point of intersection of pre-history and practice that can open up "historical" to the social historian and social history to the intensivist.

R. K. French is Director of the *Medical Unit to the History of Medicine, University of Cambridge.*

Ubiquitous organisms

The Sulphate-reducing Bacteria
by J. R. Postgate
Cambridge University Press, £13.00
ISBN 0 521 22188 9

The sulphate-reducing bacteria must be among the least attractive forms of life. Whenever water becomes devoid of oxygen, as a result of too much organic matter or pollution, they thrive, generating a stink of hydrogen sulphide and a black mess of ferric sulphide. Needless to say, they are a highly successful group and can be found almost everywhere. Early in the history of the earth, they may have been a dominant form of life; the major geological deposits of sulphur being the result of their activities.

Professor Postgate is one of the select group of microbiologists who have investigated these organisms for many years. His account of the sulphate-reducing bacteria is wide-ranging and authoritative, covering their classification, growth, biochemistry and ecology. Essentially, there are two genera, *Desulfobacter* and *Desulfococcus*, and the various species are fairly well characterized now, but reliable methods of culture have been developed.

Their novel metabolic processes - they oxidize organic substrates and reduce sulphate to sulphide - are not using oxygen are still the subject of much investigation as they still show clear evolutionary links.

living. In terms of the known metabolic reactions, the energy required to reduce sulphate exactly balances the energy obtained from oxidation of organic acids. Perhaps the time has come to investigate chemosynthetic mechanisms for the formation of adenosine triphosphates (the universal energy carrier) to these organisms.

Meanwhile, they have proved to be a rich source of bizarre redox proteins and enzymes, for example, their hydrogenase, I was surprised to learn, is responsible for the electron transport they carry in the iron pipes of circulating water systems. The economic significance of the sulphate-reducing bacteria lies in their nuisance value: they aggravate the effects of pollution and cause the corrosion of iron pipes. Attention has been directed to methods of control. The simplest remedy is a liberal supply of oxygen, which they cannot tolerate; and for this reason, they cannot become serious pathogens in man. This could account for the fact that they have not attracted the attention of medical researchers. Nevertheless, this highly readable book succeeds in revealing the sulphate-reducing bacteria as a fascinating, if not attractive, group of organisms.

Richard Cammack is Lecturer in Microbiology, Kings College, London.

Seaweed potential

Biology of Seaweeds: levels of organization
by A. R. O. Chapman
Edward Arnold, £5.35
ISBN 0 7131 2759 7

Seaweeds are rarely honoured with a book all to themselves. They are usually lumped in with their taxonomic cousins, the microscopic and freshwater algae, or their ecological neighbours, the intertidal animals. In these contexts they are often overshadowed these days because they are less convenient or less attractive subjects for the modern experimental biologist.

Several features of the biology of macroscopic green, brown and red algae are, however, unique among the plants, and the potential of seaweed cultivation for waste treatment and energy production looks very exciting. Seaweeds fully deserve the modern specialist treatment offered by this book.

As implied by the subtitle, Dr Chapman discusses the biology of seaweeds at a series of levels of organization - the cell, the whole organism, the population and the community - and he is clearly determined to escape from the descriptive, systematic approach of so many algal texts and courses.

The first section deals with cell structure and cell function, but relatively little of the work discussed has been done with seaweeds, and the information is not uniquely relevant to them. Seaweed cells are not, after all, substantially different from other plant cells, and the basic approach of the book seems least successful at this level of organization.

At the whole plant level, however, seaweeds have many unique features to offer. In this section, Dr Chapman gives a fascinating, if

somewhat tantalizing, account of these in chapters on thallus structure, physiology and reproduction. The many detailed references to original papers provide some compensation for the brevity of his discussion.

The final two sections on populations and communities add the dimensions to the standard treatment of algae. The population biology of plants is still in its infancy, but Dr Chapman describes some interesting examples of recent work with seaweeds which make a significant contribution to this field and which should provide stimulating ideas for student projects along similar lines.

The chapter on community structure contains a valuable assessment of the recent applications of quantitative ecological techniques to the perennial topic of seaweed succession, and the book ends with a strongly argued case for seaweed cultivation, which is more than the physiological tolerances of individual species, as the only casual factor of such zoos.

One major disappointment is that there is only one reference to seaweed ecology. If readers are to obtain the full benefit from this directory text, such as this is written by people who are experts in the field rather than by people who are experts at writing introductory texts, the authors should not be too modest about discussing their own contributions to the field. Enthusiasm and involvement will be more readily appreciated than a nice balance between all its aspects of a subject.

M. J. Dring is lecturer in botany at Queens' University, Belfast.

Atlas of rock-forming minerals in thin section

W S MacKenzie and C Guilford

This full colour handbook illustrates the appearance of common rock-forming minerals as seen in thin section under the polarizing microscope. It is designed to be used as a laboratory manual alongside the standard mineralogy texts. This book contains over 200 photomicrographs accompanied by short descriptions and summaries of the optical properties of the various minerals. The photomicrographs are taken in either plane-polarized light or under crossed polars, and are carefully chosen to show the features by which the minerals can most easily be recognized.

Publication: March 1980
0 582 45501 X 28cm 112 pages Colour photographs
Paper: Probably £8.50 net

Atlas of Flowering Plant Structure

J C Roland and F Roland

(Translated by Denis Baker)

This Atlas illustrates the many aspects of flowering plant structure through a unique mixture of line diagrams, light, micrographs and transmission and scanning electron micrographs, backed up by a clear and concise text. The authors consider the plant throughout its life cycle, from the seedling stage through to maturity, with flowering and fruiting, the production of seed and to complete the cycle - embryo development and seed germination. Throughout, the text relates the structural features to their physiological function, within the plant and, in a comparative way, to the evolutionary aspects of the development of plant form.

Publication: August 1980
0 582 45589 8 26cm 112 pages Photographs and line drawings
Paper: Probably £5.95 net

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Longman House, Burn Mill, Harlow, Essex

Enigmatic, shadowy figure

Howard Florey: the making of a great scientist
by Guy Macfarlane
Oxford University Press, £7.95
ISBN 0 19 58161 0

Although Howard Florey has undoubtedly taken his place in the pantheon of great medical scientists, he has until now been an enigmatic, shadowy figure. Despite such achievements as a Nobel Prize, the Presidency of the Royal Society and a life peerage, Florey, even during his lifetime, was virtually unknown to the medical profession and general scientific community. Since his death in 1968 the only useful source of information has been Professor Edward Abraham's short biographical memoir published by the Royal Society in 1971. Happily we now have a very illuminating full-length biography by another former colleague of Florey's.

A helpful introduction sketches the evolution of medical science in Britain, paying particular attention to the struggles of Alexander, Burdon Sanderson and others to establish the key departments of physiology and pathology or Oxford towards the end of the last century. Only a couple of decades were to elapse before the young Australian, Florey, arrived at Sherrington's laboratory in Oxford to take up a Rhodes Scholarship.

His Adelaide background is well described: the son of a prosperous shoemaker, who had emigrated from Oxfordshire, Florey - not surprisingly - had a brilliant school and university career. However, only one of his medical school teachers could be regarded as distinguished.

This was Archibald Watson, an anatomist, whose varied career had included spells as a pirate on the high seas and as an assistant and instructor in anatomy at Pasteur. Although Florey took part in some of his professor's more extraordinary escapades, the personalities of the two men were poles apart. Yet the retiring, rather withdrawn student was deeply influenced by the breadth of interests and fiercely independent mind of his teacher.

Highly revealing glimpses of Florey's thoughts and opinions are obtained from the numerous correspondence with his future wife, and fellow doctor, Ethel Reed, which extended from 1920 to 1926.

Florey's research career continued with remarkable consistency for more than 40 years despite fairly frequent moves (at least up to 1935) between Oxford, Cambridge, Philadelphia, Chicago, New York, London, Cambridge, Sheffield and finally Oxford again. The central theme of his life was the treatment of the boundaries between physiology and pathology, was the study of the major protective mechanisms of the body. These included the responses of blood vessels, lymphatics and the mononuclear cells (macrophages, polymorphs) to various injuries and inflammation. The secretion and function of gastro-intestinal mucus was a particular enthusiasm, stemming from his own chronic dyspepsia. It was this specific interest that led eventually to his crucial work on penicillin and other antibiotics.

The tangled story of Florey's rescue and development of penicillin began with his resurrection of

an earlier and equally forgotten discovery by Alexander Fleming, a mycologist. This antibacterial component of many types of cellular secretions was thoroughly investigated by Florey and various co-workers, notably Ernst Chain, who in 1938 then began a systematic study of other substances possessing activity against bacteria.

Penicillin was thus rediscovered for possibly the twelfth and certainly the last time. Professor Macfarlane's book depicts the numerous myths surrounding this subject and clearly explains why Florey alone received most of the credit for work that had been almost entirely carried out by Florey and his colleagues. Ironically, Florey himself was largely responsible for this controversy, as it was he who in 1942 drove many of his colleagues and interviewers and photographers all of whom were welcomed by Florey's 55 miles away.

The detailed biographical study ends in 1945, and a short epilogue lightly sketches in the remaining years of his life. Although 23 busy years still need to be filled in, the book has amply fulfilled the promise of its subtitle. We have been shown with remarkable clarity "the making of a great scientist" who was one of the most complex and paradoxical figures of our century.

Sidney Selwyn is professor of medical microbiology in the Westminster Medical School, London.

Import of resistant genes

Plasmids
by Paul Brode
W. H. Freeman, £6.90
ISBN 0 7167 1111 7

Work on bacterial plasmids, during the past twenty-five years, has had a major impact on the way we think of micro-organisms. Moreover, there is a real chance that it will also, in time, have an equally dramatic effect on our understanding of the evolution of complex multicellular life forms.

Plasmids are genetic units which can survive in bacteria independently of the bacterial chromosome. They are often "infectious", that is they can be transferred between bacteria and establish themselves in strains or species which have not carried them before. And if the plasmid carries genetic information which leads to the expression of characters not already present in the recipient organisms, the situation is evolutionary potential may well have been created.

The information brought into bacteria by plasmids often seems to be unnecessary for the survival of the bacteria except in certain very restricted environmental conditions. Good examples of this are those

plasmids conveying resistance to antibiotics. They allow otherwise sensitive bacteria to grow in the presence of antibiotics to which the plasmids specify resistance, but in the absence of the antibiotics the plasmids have little relevance for growth.

A particular point of interest is the genetic information of common ecological relevance tends to accumulate in individual plasmids. So antibiotic resistance plasmids commonly carry more than one distinct type of resistance gene, and this tends to reflect an ecological niche, such as a hospital, where widespread antibiotic use is prevalent. The characteristics of bacterial plasmids therefore allow us to see them clearly as potential agents of bacterial evolution, allowing blocks of pre-evolved genetic information to be acquired at a stroke. Plasmids have revolutionized our whole view of bacterial populations. No longer are they seen as static entities, genetic arrangements which vary in frequency based on modulation of gene expression, but rather as highly flexible pools of genetic information.

Dr Paul Brode's book has documented the growing awareness of the importance of plasmids in biology. There were many who said, only a year or two ago, that the whole subject of bacterial plasmids had become so massive, and the literature so voluminous, that it was impossible any longer for one person to write a book on the subject. And indeed most of the latest publications are collections of chapters contributed by experts under the guidance of an editor. Clearly, when Brode set out to write this book he must have been quite aware of the sheer volume of information with which he had to deal. One has to say he has succeeded very well indeed.

This is no heavy tome: the text amounts to only about 150 pages. But within this compass he gives a succinct and informative account of many aspects of plasmid biology - in a molecular, environmental, medical and even commercial context. This is a book for the initiated, its contents will be all but second nature to most who are familiar with the field. There are few flights of fancy and there seem to be no really original insights. On the other hand, for those entering the field or for those who want to be informed about this aspect of "micro-microbiology", the book is first class. The views of the authors are balanced and clear. The references are copious and well chosen. In short, Dr Brode's book is a

gratuitous on his efforts. If I had to single out any two aspects of this book which are particularly good, I would choose first the sections which deal with the more applied aspects of plasmids, that is, their impact on situations such as our everyday life. Brode has dealt with some of the medical implications of plasmids very well and this is a part of the field which is currently growing extremely rapidly. The second aspect that is dealt with particularly well is the very recent phenomenon of transposition. Just as plasmids can move between bacterial cells, so individual genes, organized as specialized units known as transposons, can move between plasmids. It is in this way then, that individual plasmids acquire complexes of genes which tend to reflect whole ecological niches. We still do not know a great deal about the detailed mechanism of transposition, but what we do know is well described in this book, though it is a section which is already somewhat dated.

So what of the impact of plasmid studies on biology as a whole? How is it that this field of microbial genetics and biochemistry may have such enormous implications for our understanding of the evolution of complex forms? One of the great problems of the Darwinian hypothesis, as interpreted through classical genetics, is the difficulty of seeing how vast evolutionary progress can occur by the step-wise mutation of genes which are already likely to be highly refined for a particular role. What plasmid studies now show is that blocks of genetic information, reflecting particular ecological conditions, can move from one organism to another so that a whole set of characters of potential selective advantage can be acquired in one step. Should this sort of phenomenon be shown to occur with eukaryotic species - and there is already evidence that suggests it does - we can begin to see for the first time how blocks of pre-evolved genetic information might give an existing organism novel selective advantage. If this is indeed the way that new species arise, work on bacterial plasmids will have had a major impact on biology as a whole. Dr Brode's book will be one of those which has most copiously charted the discovery, for the general reader.

Mark Richmond is professor of bacteriology in the University of Bristol Medical School.

New Books from Yale

Splendid Isolation

The Curious History of South American Mammals
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This fascinating and picturesque history of evolution, written by the doyen of American paleontologists, is the culmination of fifty years of study of such weird creatures, now extinct, as the giant ground sloths, the lank-like armoured glyptodonts, and the sabretoothed marsupials. Illustrated throughout, it is addressed to readers of all ages and backgrounds. *Forthcoming* £11.00.

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Summarises recent research on animal populations, including man, in a variety of natural and experimental situations as observed by biologists, anthropologists and social psychologists. *Forthcoming* £12.60

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A. R. E. Sinclair & M. Notton-Griffiths, editors

SERENGETI

Dynamics of an Ecosystem

The Serengeti National Park in Tanzania contains some of the largest herds of grazing mammals found anywhere in the world, making it an incomparable resource for the scientists who have contributed to 'Serengeti: Dynamics of an Ecosystem'. Starting in the 1950s and expanding in the 1960s with the formation of the Serengeti Research Institute, the group examined numerous biological aspects of the ecosystem in order to make recommendations for the area's conservation. This book synthesizes some aspects of the processes and patterns studied in the tropical savanna over the past twenty years; the emphasis is on the changes that have taken place and the development of ideas on how the system functions.

March 1980, 384 pages, 32 plates, £17.10p.

The Spotted Hyena: A Study of Predation & Social Behavior, by Hans Kruuk, now in paperback £9.30.

The University of Chicago Press

126 Buckingham Palace Road, London SW1W 9BB

Colleges of Higher Education continued

NIHE

National Institute for Higher Education Dublin
Fórsa Náisiúnta in Ardleaghas Baile Átha Cliath

The National Institute for Higher Education, Dublin, the most recently established Higher Education Institution in Ireland, is now recruiting its first Academic Staff to participate in the establishment of its initial programmes, on which its first students will enroll in Autumn 1980.

Applications are invited for appointment to the following posts within the Faculty of Science:

Head of School of Biological Sciences

Head of School of Chemical Sciences

Lecturers in:

Biological Sciences

(Botany, Zoology, Microbiology, Biochemistry)

Chemical Sciences

(Physical, Inorganic, Organic, Analytical)

The first programme to be developed within the Faculty of Science will be a Degree Course in Analytical Science. Further substantive course developments are anticipated and research programmes of a substantial nature will be promoted and developed.

QUALIFICATIONS: Candidates will be highly qualified academically, preferably holding a higher degree or professional qualification, with considerable industrial, business and academic or research experience at an advanced level.

Considerable importance will be attached to the teaching and research abilities of candidates.

SALARIES: Appointment as Head of School may be at Principal Lecturer or Senior Lecturer level. The appropriate salary scales (effective 1/3/1980) are as follows:

Principal Lecturer: £11,744 - £13,458
Senior Lecturer: £8,776 - £12,226
Lecturer: £6,813 - £11,216

REVISED SALARIES

The above salary scales are under review and are expected to attract significant increases. Details will be available to applicants.

CLOSING DATE:

16th April, 1980.

Application Forms and further details are available from: Personnel Office, National Institute for Higher Education, 1 Lower Grand Canal Street, Dublin 2, Ireland. Telephone: Dublin 763175.

Candidates who have responded to previous general advertisements need not re-apply as their applications will automatically receive consideration.

NIHE

National Institute for Higher Education Dublin
Fórsa Náisiúnta in Ardleaghas Baile Átha Cliath

Applications are invited for appointment to the following posts within the School of Communications:

Lecturer in Social Psychology

Lecturer in Linguistics/Socio-linguistics

Lecturer in Media Sociology

The appointees will have responsibility for planning and teaching on the BA and BA (Honours) Degree Courses in Communications Studies.

QUALIFICATIONS: Candidates will be well qualified academically, preferably holding a higher degree or professional qualification. Considerable importance will be attached to the teaching and research abilities of candidates.

SALARY SCALE: £6,813 - £11,216

REVISED SALARY SCALE: The above salary scale is under review and is expected to attract significant increases. Details will be available to applicants.

CLOSING DATE: 16th April, 1980.

Application Forms and further details are available from: Personnel Office, National Institute for Higher Education, 1 Lower Grand Canal Street, Dublin 2, Ireland. Telephone: Dublin 763175.



APPOINTMENT OF LECTURERS, GRADE II

Applications are invited from well-qualified graduates or graduate equivalents for the following posts in this Church of England Voluntary College of Higher Education (1,700 men and women). The appointments will date from 1st September, 1980. The College, which was formed in 1975 through the amalgamation of The College, Ripon, with St. John's College, York, offers courses leading to the following Collegiate awards of the University of Leeds: BA/BSc (Hons and Ord) degree BEd (Hons) degree, Diploma in Higher Education, Post-Graduate Certificate in Education, the post-experience Certificate in Applied Social Studies, the Diploma in Special Education and the Certificate in Education for Teachers of Nurses. The College also offers courses leading to the award of the Diploma of the British Association of Occupational Therapists. The appointments will be at the appropriate point on the Lecturer, Grade II, Scale (£4,808-£7,688 - under review).

DEPARTMENT OF DRAMA, FILM AND TELEVISION, HUMAN MOVEMENT STUDIES AND MUSIC Film and Television

The person appointed will be required to cooperate in the teaching of courses concerned with the theory and practice of visual communication. A proven ability to teach aspects of this subject is essential; recent practical experience of professional television production, or a similarly relevant area of experience, is highly desirable.

Human Movement Studies

(Temporary one-year appointment to replace a member of staff on secondment.)

The person appointed is likely to be responsible for gymnastics and to contribute to athletics and games studies.

DEPARTMENT OF GEOGRAPHY

Applicants should have a principal interest in Human Geography coupled with Western Europe and/or the USSR.

DEPARTMENT OF HISTORICAL STUDIES

(Two appointments)

One appointment will require experience in modern European and British history from the mid-18th Century with a specialism in Victorian Britain and/or local history in this period. For the other appointment, some of the following interests need to be available: American History or American Studies, Imperial and/or Post-Imperial history.

DEPARTMENT OF LANGUAGE AND LITERATURE

(Two appointments)

Candidates should be well-qualified graduates in English, with clearly defined areas of special interest. They should also be able to contribute to teaching of a wide range of English or American literature courses.

Further details of all the above posts and application forms may be obtained from the Principal, The College of Ripon and St. John, Lord Mayor's Walk, York YO3 7BX, to whom completed application forms should be returned to arrive not later than MONDAY, 21st APRIL, 1980.

SOUTH GLAMORGAN COUNTY COUNCIL SOUTH GLAMORGAN INSTITUTE OF HIGHER EDUCATION (CARDIFF)

FACULTY OF EDUCATION

PHYSICAL EDUCATION DEPARTMENT

APPOINTMENT OF TWO LECTURERS

GRADE 2

RE-ADVERTISEMENT

Applications are invited from suitably qualified persons for the following teaching appointments (vacancies from 1st September, 1980):

TWO LECTURERS GRADE II: PHYSICAL EDUCATION

Applicants should be graduates with specialist physical education qualifications. The postholder of a higher degree will be required to lecture to the B.A. (Hons) Human Movement Studies Degree Course and to supervise the practical work of students on the B.A. (Hons) Human Movement Studies Degree Course. The postholder of a higher degree will also be required to supervise the practical work of students on the B.A. (Hons) Human Movement Studies Degree Course. The postholder of a higher degree will also be required to supervise the practical work of students on the B.A. (Hons) Human Movement Studies Degree Course.

Also, application at a very high level of personal performance and teaching/coaching will be required in the practical work of students on the B.A. (Hons) Human Movement Studies Degree Course.

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College of St. Mark & St. John

PRINCIPAL LECTURER

PROFESSIONAL STUDIES LEADER (SECONDARY)

The main function of this post is to lead the College in reviewing and its secondary professional studies work at in-service and pre-service levels in the light of the contemporary curriculum debate. We are looking for a person who has held a post of Senior responsibility in secondary schools and has experience of curriculum development in schools.

PRINCIPAL LECTURER

COURSE LEADER B.ED FOR SERVING TEACHERS (CNAA)

We are looking for a person who will be able to contribute to professional courses in education. The person appointed will be responsible for the teaching of courses in education. The person appointed will be responsible for the teaching of courses in education. The person appointed will be responsible for the teaching of courses in education.

For further details please write to Mrs. Jean L. B. Pugh, Secretary, to whom applications should be sent on or before 18 April 1980.

The college offers BA, BEd and BSc degrees and Advanced Diplomas and Degrees in Education.

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of Yeo Minister will under-
why. The DES uses such
acronyms and euphem-
Some will still ramble
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this gom. from a recent
"news item": "from 1969 the
relationship represents in effect
has been falling. Over OLR and
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mean of that?

The fact that one "caps" all
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common educational cottage. I
does at least indicate
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DES thinking on polytechnic
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will note nothing.

The author is MP for Rivne.

On Wednesday I'm on home ground, teaching on the degree course which occupies most of my time as both lecturer and bureaucrat. Those of us who teach English are naturally pleased that a good number of students take up the opportunity to read for a "pure," English degree—"traditional," as the modish seniors once called it, or the "old-fashioned" of Modern Languages and Literature in Translation options preserves a healthy plurality.

A day of seminars brings my week to an end. Sitting at my desk late in the afternoon, I enjoy the view of a little park next door where the watery sunlight now and then offers a clearer impression of some dull-coloured but hyperactive squirrels. The whole place is momentarily quiet. It's functional, but not ugly building, though much of the teaching accommodation is decidedly less so; long conversation with last year's distinguished young scholar, as I escorted him from the staff lounge to his first lecture, reached its only pause when we attained an emerald green which looks down on rows of drab grey roofs. "And here," I said, "we come together to triumph at a tone. 'The Huts' " I added, after a silence which can only have increased the drama, and with a sudden gasp I belonged to quite another sentence. "The Huts," I had started. Well, we have made do for several years, and the temporary has become the all. I can't say that I shall miss rooms that are hot in summer and too cold in winter. I shall miss the summer, we move to Tottenham. But the remnants of Hadden village form an attractive sort of perchwork, and even the customary Friday traffic jam acquires a certain tawdry romance as I stroll past it on my way home.

Mike Walters

The author is deputy course leader (at present acting course leader) of the B.A. Modern English Studies degree at Middlessex Polytechnic.

